

CLAIMS

What I claim is:

1. A method of fabricating a plurality of micro probes comprising the steps of:
defining the shapes of a plurality of probes as a mask;
applying a photoresist to a side of a first metal material;
overlaying said mask on said side of said first metal material;
exposing said photoresist to light passed through said mask;
developing said photoresist;
removing a portion of said photoresist to expose a portion of said first metal material;
electroforming a second metal material on said exposed portions of said first metal material; and
removing said second metal material to produce a plurality of probes.
2. The method of claim 1 wherein said first material is stainless steel.
3. The method of claim 1 wherein said second material is selected from one of Nickel and Nickel-Cobalt alloy.
4. A micro probe manufactured according to the method of claim 1 said micro probe comprising:
a probe base having a generally uniform thickness bounded by a plurality of edges and extending for a substantially straight length in a plane;
a probe shaft connected to said probe base said probe shaft of said generally uniform thickness, bounded by a plurality of edges, and extending along a curved expanse within said plane;
a probe end connected to said probe shaft said probe end of said generally uniform thickness, bounded by a plurality of edges, and extending for a substantially straight distance within said plane said straight distance being approximately parallel to said straight length; and

a scallop running substantially around a periphery comprised of the edges of said probe base, said probe shaft, and said probe end.

5. The micro probe of claim 4 wherein said uniform thickness is between 2 mils and 5 mils.
6. The micro probe of claim 5 wherein said uniform thickness is between 3 mils and 4 mils.
7. The micro probe of claim 6 wherein said scallop further comprises a scallop base and a scallop tip.
8. The micro probe of claim 7 wherein said scallop base and said scallop tip are separated by a substantially uniform distance.
9. A probe test head comprising:
 - a first die comprised of first and second opposing planar surfaces said first die further comprising a pattern of first die holes extending through said first die in a direction perpendicular to both of said first and second planar surfaces;
 - a second die comprised of third and forth opposing planar surfaces said second die further comprising a pattern of second die holes corresponding to said pattern of first die holes said second die holes extending through said second die in said direction wherein said third planar surface is arranged in planar contact with said second planar surface such that said second die holes are offset from said first die holes in a substantially uniform direction; and
 - a plurality of probes one each of said probes extending through one of said first die holes and one of said second die holes said probes having a surface finish commensurate with having been formed by electroforming.
10. The probe test head of claim 9 further comprising two spacing covers one each of said spacing covers inset into said first and second die.

11. The probe test head of claim 9 wherein each of said plurality of probes is substantially uniform in shape when compared to each other one of said plurality of probes.
12. The probe test head of claim 9 wherein the length of each of said plurality of probes is within .002 inches of every other one of said plurality of probes.
13. The probe test head of claim 12 wherein the length of each of said plurality of probes is within .001 inches of every other one of said plurality of probes.
14. The probe test head of claim 13 wherein the length of each of said plurality of probes is within .0005 inches of every other one of said plurality of probes.
15. A method of manufacturing a probe test head, the method comprising:
 - defining shapes of a plurality of probes as one or more masks;
 - a step for fabricating the plurality of probes using the one or more masks;
 - disposing the plurality of probes through a corresponding first plurality of holes in a first die, the first die including first and second opposing planar surfaces and the first plurality of holes extending through the first die between the first and second opposing planar surfaces; and
 - disposing the plurality of probes through a corresponding second plurality of holes in a second die, the second die including third and fourth opposing planar surfaces and the second plurality of holes extending through the second die between the third and fourth opposing planar surfaces.
16. The method of claim 15, wherein the step for fabricating the plurality of probes using the one or more masks includes:
 - applying a photoresist to a side of a first metal material;
 - overlaying the one or more masks on the side of the metal first material;
 - exposing the photoresist to light passed through the one or more masks;
 - developing the photoresist;

removing a portion of the photoresist to expose a portion of the first metal material;
electroforming a second metal material on the exposed portions of the first metal material; and
removing the second metal material to produce a plurality of probes.

17. The method of claim 15, wherein the step for fabricating the plurality of probes using the one or more masks includes:

applying a photoresist to first and second opposing sides of a metal foil;
overlaying at least one of the masks on each of opposing first and second sides of the metal foil;
exposing the photoresist to light passed through each of the masks;
developing the photoresist;
removing a portion of the photoresist to expose a portion of the metal foil;
and
applying an etcher to the surface of the metal foil to remove the exposed portion to produce a plurality of probes.

18. The method of claim 15, wherein each probe in the plurality of probes includes:

a probe base having a generally uniform thickness bounded by a plurality of edges and extending for a substantially straight length in a plane;
a probe shaft connected to the probe base the probe shaft of the generally uniform thickness, bounded by a plurality of edges, and extending along a curved expanse within the plane;
a probe end connected to the probe shaft the probe end of the generally uniform thickness, bounded by a plurality of edges, and extending for a substantially straight distance within the plane the straight distance being approximately parallel to the straight length; and
a scallop running substantially around a periphery comprised of the edges of the probe base, the probe shaft, and the probe end.

19. The method of claim 18 wherein the uniform thickness is between 2 mils and 5 mils.
20. The method of claim 19 wherein the uniform thickness is between 3 mils and 4 mils.
21. The method of claim 18 wherein the scallop further comprises a scallop base and a scallop tip.
22. The method of claim 21 wherein the scallop base and the scallop tip are separated by a substantially uniform distance.